

CLAIMS

What is claimed is:

1 1. A node for a storage area network
2 comprising:
3 at least one processor;
4 at least one port for connection to a
5 storage area network coupled to the at least one
6 processor; and
7 a memory system coupled to the at least one
8 processor;
9 wherein the memory system contains machine
10 readable instructions comprising instructions for:
11 determining a status associated with the at
12 least one port, the status capable of having at least
13 an active, a normal, a probationary, and a failed
14 value;
15 when the status has a failed value, of
16 detecting a repair associated with the at least one
17 port and when repair is detected advancing the status
18 to a value selected from the group consisting of
19 active and probationary status;
20 detecting when the port operates without
21 error for a predetermined period and thereupon
22 advancing the status from the probationary value to a
23 value selected from the group consisting of active and
24 normal; and
25 preferentially routing exchanges over a port
26 of the at least one port having a status value
27 selected from the group of active and normal when a
28 port having such status exists and a target node of
29 the exchange is reachable over that port.

1 2. The node of Claim 1, wherein the port is a
2 fibre channel N_port, L_port, or NL_port.

1 3. The node of Claim 1, wherein the memory
2 system contains machine readable instructions further
3 comprising instructions for:

4 determining that a port having an
5 associated status of probationary has encountered
6 excessive errors, and when said excessive errors are
7 detected for changing that status to failed.

1 4. The node of Claim 3, wherein the machine
2 readable instructions for determining that a port
3 having an associated status of probationary has
4 encountered excessive errors includes instructions of
5 ignoring errors detected within a predetermined period
6 of time of the port seeing a network login attempt
7 made by a second node of the network.

1 5. The node of Claim 4, wherein the memory
2 system contains machine readable instructions further
3 comprising instructions for taking laser diodes of a
4 port of the at least one port offline when status
5 associated with that port is changed to failed, and
6 for placing those laser diodes online when said status
7 is changed to a status selected from the group
8 consisting of active, normal, and probationary.

1 6. The node of Claim 1, wherein the memory
2 system contains machine readable instructions further
3 comprising instructions for conducting login attempts
4 over each port of the at least one port, for
5 determining target nodes reachable through each port,
6 and for recording in the memory system identities of
7 target nodes reachable through each port.

1 7. The node of Claim 6, wherein the memory
2 system contains machine readable instructions further
3 comprising instructions for promoting status
4 associated with a port from probationary to a value
5 selected from the group consisting of normal and
6 active when an exchange to a particular target node of
7 the target nodes is pending and that target node is
8 not reachable through any port already having an
9 associated status selected from the group consisting
10 of normal and active.

1 8. The node of Claim 6, wherein the memory
2 system contains machine readable instructions further
3 comprising instructions for testing a port for repair
4 if that port has failed status, an exchange to a
5 particular target node of the target nodes is pending,
6 and the particular target node is not reachable
7 through any other port already having an associated
8 status selected from the group consisting of
9 probationary, normal and active.

1 9. A method for assigning exchanges to ports of
2 a node of a storage area network, the node having at
3 least one port for connecting the node to the storage
4 area network, comprising the steps of:

5 determining a status associated with each
6 port of the at least one port, the status capable of
7 having at least an active, a normal, a probationary,
8 and a failed value;

9 when the status has a failed value, of
10 detecting a repair associated with the associated port
11 and when repair is detected advancing the status to a
12 value selected from the group consisting of active and
13 probationary status;

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14 detecting when each port having probationary
 15 status operates without error for a predetermined
 16 period and thereupon advancing the status from
 17 probationary to a status selected from the group
 18 consisting of active and normal; and

19 preferentially assigning exchanges to ports
 20 having a status value selected from the group of
 21 active and normal when at least one port having such
 22 status exists and a target node of the exchange is
 23 reachable over that port.

10. The method of Claim 9 wherein the port is a
 fibre channel N_port, L_port, or NL_port.

11. The method of Claim 9, further comprising
 the step of

determining that a port having an
 associated status of probationary has encountered
 excessive errors, and when said excessive errors are
 detected for changing that status to failed.

12. The method of Claim 11, wherein the step of
 determining that a port having an associated status of
 probationary has encountered excessive errors ignores
 at least some errors detected within a predetermined
 period of time of the port seeing a network login
 attempt made by a second node of the network.

13. The method of Claim 11, further comprising
 the steps of:

taking laser diodes of a port offline when
 status associated with that port is changed to failed,
 and for placing those laser diodes online when said
 status is changed to a status selected from the group
 consisting of active, normal, and probationary.

1 14. The method of Claim 13, further comprising
2 the steps of
3 conducting login attempts over each port
4 having online laser diodes,
5 determining target nodes reachable through
6 each port, and
7 recording in the memory system identities of
8 target nodes reachable through each port.

1 15. The method of Claim 14, further comprising
2 the steps of
3 promoting status associated with a port from
4 probationary to a value selected from the group
5 consisting of normal and active when an exchange to a
6 particular target node of the target nodes is pending
7 and that target node is not reachable through any port
8 already having an associated status selected from the
9 group consisting of normal and active.

1 16. The node of Claim 15, further comprising the
2 step of testing a port for repair if that port has
3 failed status, an exchange to a particular target node
4 of the target nodes is pending, the particular target
5 node is possibly reachable through the port having
6 failed status and the particular target node is not
7 reachable through any other port having an associated
8 status selected from the group consisting of
9 probationary, normal and active.

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